ASYMMETRIC POLYIMIDE MEMBRANES

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DU PONT

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Abstract of GB1435151

1435151 Polyimide membranes E I DU PONT DE NEMOURS & CO 19 July 1973 [20 July 1972] 34397/73 Heading B5B [Also in Divisions B1 and C3] Microporous polyimide membranes, asymmetric in that they are composed of a thin relatively dense barrier layer on at least one surface and a less dense layer, are obtained from an aromatic polyamic acid solution. The solution in solvent A is formed into a membrane which is contacted with a cyclizing composition comprising a C 1 -C 6 aliphatic carboxylic anhydride and a tertiary amine with or without a solvent B. If the tertiary amine is a solvent for the polyamic acid then a solvent B which is miscible with A and a non-solvent for the polyamic acid is used. When the tertiary amine is a non-solvent for the polyamic acid then solvent B whether miscible with A or not or capable of dissolving the polyamic acid or not, need not be used. In the latter case the tertiary amine must be miscible with solvent A. The polyimides have the following formula and, depending on the choice of R and R<SP>1</SP>, they may be soluble in a common organic sol- vent or not. For insoluble membranes R is selected from the group comprising and E<SP>1</SP> from phenylene. tolylene, naphthylene, biphenylene, anthrylene, pyridinediyl and in which R<SP>7</SP> is oxygen sulphur or methylene. Other radicals disclosed for R are and where R<SP>2</SP> is C 1 -C 3 alkylene or haloalkylene, oxygen, sulphur, -SO 2 -, in which R<SP>3</SP> and R<SP>4</SP> are C 1 -C 6 alkyl or phenyl, and for R<SP>1</SP> where R<SP>2</SP> is as defined above. The membranes may be washed, for example in benzene followed by ethanol and then by water, and then air-or vacuum-dried. Example 86 illustrates the preparation of the membrane in the form of a porous fibre by extruding the polymeric acid into a bath of the cyclizing agent.

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